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Dairy Herd Improvement Letter

Vol. 52, No. 5

ARS-60-7

NATIONAL COOPERATIVE
DAIRY HERD IMPROVEMENT
PROGRAM
A dairy recordkeeping plan
for every herd

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Issued December 1976

ARTIFICIAL INSEMINATION REPORT FISCAL YEAR 1975 1/

The Artificial Insemination Report for fiscal year (FY) 1975 consists of semen units sold or custom-frozen or both by member organizations of the National Association of Animal Breeders, by breed. The data includes international sales. Data by organization will no longer be published.

Table 1 shows 148,053 fewer units of dairy semen sold in FY 1975 than in FY 1974. Of these, 92 were Red Dane, included as beef and dual purpose for FY 1975. There were 3,180 fewer units of dairy semen custom-frozen in FY 1975 than in FY 1974. A total of 11,352,327 units of dairy semen were sold or custom-frozen in FY 1975.

Table 1 also shows 989,235 fewer units of beef and dual purpose semen sold in FY 1975 than in FY 1974. There were 249,885 fewer units of beef and dual purpose semen custom-frozen in FY 1975 than in FY 1974. A total of 3,306,382 units of beef and dual purpose semen were sold or custom-frozen in FY 1975.

Data by States was not furnished for FY 1975.

Table 2 is a list of names and addresses of Extension Dairymen advising on dairy cattle breeding programs in each State.

1/ Prepared by Gerald J. King, dairy husbandman, Animal Improvement Programs Laboratory, Animal Physiology and Genetics Institute, Northeastern Region, ARS, USDA, Beltsville, Md. 20705, from data received from the National Association of Animal Breeders.

TABLE 1.--UNITS OF SEMEN SOLD AND CUSTOM-FROZEN IN FY 1975, BY BREED 1/

BREED	U.S. SALES	INTERNATIONAL SALES	CUSTOM-FROZEN	TOTAL
DAIRY				
AYRSHIRE	72,887	2,040	11,421	86,348
BROWN SWISS	172,803	149,800	65,037	387,640
GUERNSEY	366,708	4,082	24,709	395,499
HOLSTEIN	8,616,321	793,354	444,576	9,854,251
JERSEY	458,097	22,864	42,340	523,301
MILKING SHORTHORN	20,651	626	3,832	25,109
RED AND WHITE	51,946	7,224	520	59,690
MIXED AND UNNAMED	0	0	20,489	20,489
TOTAL DAIRY	9,759,413	979,990	612,924	11,352,327
BEEF AND DUAL PURPOSE				
ANGUS	517,135	12,368	280,270	809,773
BARZONA	215	0	0	215
BEEFALO	1,002	0	2,785	3,787
BEEF FRIESIAN	228	10	879	1,117
BEEF MASTER	826	0	1,895	2,721
BLONDE D'AQUITAINE	10,639	27	0	10,666
BRAHMAN	54,429	49,212	61,683	165,324
BRANGUS	3,276	1,508	50,036	54,820
BUFFALO	0	0	1,519	1,519
CHARBRAY	0	0	548	548
CHAROLAIS	78,298	15,283	86,245	179,826
CHIANINA	51,683	4,854	11,997	68,534
DEVON	594	2,050	475	3,119
DEXTER	352	0	0	352
GALLOWAY	273	0	351	624
GELBVIEH	38,127	439	3,202	41,768
HAYS CONVERTER	1,996	48	0	2,044
HEREFORD	163,220	12,966	169,329	345,515
LIMOUSIN	64,692	1,598	33,985	100,275
LINCOLN RED	336	0	0	336
LONGHORN	59	0	958	1,017
MAINE-ANJOU	78,840	1,186	32,536	112,562
MARCHIGIANA	1,663	0	0	1,663
MEUSE RHINE ISSEL	1,193	142	0	1,335
MURRAY GREY	5,485	0	17,177	22,662
NORMANDE	1,757	13	0	1,770
NORWEGIAN RED	1,766	0	8,089	9,855
PINZGAUER	17,080	6	706	17,792
POLLED HEREFORD	135,504	31,199	47,280	213,983
RED ANGUS	28,334	1,352	2,307	31,993
RED BRANGUS	629	0	0	629
RED DANE	92	0	0	92
RED POLL	1,985	453	1,720	4,158
ROMANGOLA	675	80	0	755
SANTA GERTRUDIS	5,893	17,454	33,888	57,235
SCOTCH HIGHLAND	686	0	0	686
SHORTHORN	17,068	2,498	18,422	37,988
SIMMENTAL	388,384	12,980	155,162	556,526
SOUTH DEVON	90	0	579	669
TARENTAISE	32,584	0	173	32,757
WELSH BLACK	367	0	0	367
MIXED AND UNNAMED	5,171	72	401,762	407,005
TOTAL BEEF AND DUAL PURPOSE	1,712,626	167,798	1,425,958	3,306,382
TOTAL UNITS	11,472,039	1,147,788	2,038,882	14,658,709

1/ ZEROS INDICATE NO ACTIVITY.

TABLE 2.--EXTENSION DAIRYMEN ADVISING ON DAIRY CATTLE BREEDING PROGRAMS IN EACH STATE

ALABAMA----------CHARLES D. GRIFFIN, DAIRY SCIENCE DEPT., AUBURN UNIVERSITY, AUBURN 36830.

ALASKA-----------ARTHUR L. BRUNDAGE, EXPERIMENT STATION RESEARCH STAFF, UNIVERSITY OF ALASKA, PALMER 99645.

ARIZONA----------DENNIS V. ARMSTRONG, DEPT. OF DAIRY SCIENCE, UNIVERSITY OF ARIZONA, TUCSON 85721.

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CALIFORNIA-------FRANK D. MURRILL, ANIMAL SCIENCE BLDG., UNIVERSITY OF CALIFORNIA, DAVIS 95616.

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CONNECTICUT------ROBERT H. BENSON, ANIMAL INDUSTRIES DEPT., UNIVERSITY OF CONNECTICUT, STORRS 06268.

DELAWARE---------W. R. HESSELTINE, COLLEGE OF AGR. SCIENCES, UNIVERSITY OF DELAWARE, NEWARK 19711.

FLORIDA----------DANIEL W. WEBB, DAIRY SCIENCE BLDG., UNIVERSITY OF FLORIDA, GAINESVILLE 32601.

GEORGIA----------J. N. MADDUX, ANIMAL INDUSTRY DIVISION, UNIVERSITY OF GEORGIA, ATHENS 30601.

HAWAII-----------STEVEN E. OLBRICH, ANIMAL SCIENCE DEPT., UNIVERSITY OF HAWAII, HONOLULU 96822

IDAHO------------RICHARD H. ROSS, AGRICULTURAL SCIENCE BLDG., UNIVERSITY OF IDAHO, MOSCOW 83843.

ILLINOIS---------RALPH V. JOHNSON, ANIMAL SCIENCE DEPT., UNIVERSITY OF ILLINOIS, URBANA 61803.

INDIANA----------N. J. MOELLER, DEPT. OF ANIMAL SCIENCES, PURDUE UNIVERSITY, LAFAYETTE 47907.

IOWA-------------BASIL R. EASTWOOD, ANIMAL AND DAIRY SCIENCE DEPT., IOWA STATE UNIVERSITY, AMES 50010.

KANSAS-----------E. RALPH BONEWITZ, DAIRY SCIENCE DEPT., KANSAS STATE UNIVERSITY, MANHATTAN 66504.

KENTUCKY---------JOHN H. NICOLAI, JR., DAIRY PRODUCTION DEPT., UNIVERSITY OF KENTUCKY, LEXINGTON 40506.

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MISSISSIPPI------GEORGE B. CRAIN, DAIRY SCIENCE DEPT., MISSISSIPPI STATE UNIVERSITY, STATE COLLEGE 39762.

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NEVADA-----------MAX B. RADMALL, ANIMAL SCIENCE DEPT., UNIVERSITY OF NEVADA, RENO 89507.

NEW HAMPSHIRE---THOMAS R. FAIRCHILD, ANIMAL SCIENCE DEPT., UNIVERSITY OF NEW HAMPSHIRE, DURHAM 03824.

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NEW MEXICO------J. BORDEN ELLS, DAIRY DEPT., NEW MEXICO STATE UNIVERSITY, LAS CRUCES 88001.

NEW YORK---------ROBERT W. EVERETT, ANIMAL SCIENCE DEPT., CORNELL UNIVERSITY, ITHACA 14850.

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STATE AND NATIONAL STANDARDIZED LACTATION AVERAGES BY BREED FOR COWS ON OFFICIAL TEST, CALVING IN 1974 1/

State and national standardized lactation averages by breed for cows on official test that calved in 1974 are presented in tables 1 and 2. The reader should note that these averages are not the same as those used for calculating Predicted Difference.

Records Included in Averages

Only Official DHI and DHIR records that passed USDA editing (described in the December 1970 Dairy Herd Improvement Letter, ARS 44-222) were included in the averages.

Records Standardized to a 305-Day, Mature Equivalent (ME), 2X basis

Lactations for which cows were denied an opportunity to give milk for 305 days were projected to 305 days with factors that account for differences in lactation curves because of breed, age, and trait (milk or fat). The factors used by USDA were published in the August 1965 Dairy Herd Improvement Letter, ARS-44-164.

All lactations were standardized for age and month-of-calving by the factors published in USDA-DHIA Factors for Standardizing 305-Day Lactation Records for Age and Month-of-Calving, ARS-NE-40, September 1974. The factors account for variation associated with age and month-of-calving within breed, season, region, and trait (milk or fat).

Lactations made by milking three or four times a day were then reduced to a two-time-a-day basis with factors published in the January-February 1972 Dairy Herd Improvement Letter, ARS 44-239.

Fat percentages were computed from the 305-day, ME, 2X milk and fat yields.

1/ Prepared by Gerald J. King, dairy husbandman, with technical assistance of James H. Grove, computer programmer, and Evelyn F. Myers, clerk, Animal Improvement Programs Laboratory, Animal Physiology and Genetics Institute, Northeastern Region, ARS, USDA, Beltsville, Md. 20705

TABLE 1.--STATE AND NATIONAL STANDARDIZED LACTATION AVERAGES FOR AYRSHIRE, GUERNSEY, AND HOLSTEIN COWS ON OFFICIAL TEST, CALVING IN 1974 1/

	AYRSHIRE				GUERNSEY				HOLSTEIN			
STATE	RECORDS	MILK	FAT	FAT	RECORDS	MILK	FAT	FAT	RECORDS	MILK	FAT	FAT
	NO.	LB	PCT	LB	NO.	LB	PCT	LB	NO.	LB	PCT	LB
ALABAMA----------	58	11,573	3.91	452	165	10,338	4.34	448	4,151	15,016	3.61	541
ALASKA-----------	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	41	16,103	3.35	540
ARIZONA----------	43	13,801	3.66	505	902	11,134	4.48	499	4,093	15,678	3.48	546
ARKANSAS---------	2	11,445	3.79	430	230	10,363	4.42	458	2,339	14,703	3.44	506
CALIFORNIA-------	507	12,599	3.93	495	3,671	11,372	4.52	514	81,385	17,236	3.61	622
COLORADO---------	53	9,765	3.81	372	213	10,301	4.45	459	5,741	15,499	3.51	544
CONNECTICUT------	495	12,579	3.96	498	1,096	10,461	4.61	482	12,877	15,444	3.74	578
DELAWARE---------	141	12,462	4.29	535	27	11,704	5.09	596	2,004	15,745	3.68	579
FLORIDA----------	183	11,435	3.75	429	833	9,573	4.22	404	2,021	14,447	3.24	468
GEORGIA----------	107	11,482	3.76	432	635	10,892	4.67	509	6,992	14,488	3.56	516
HAWAII-----------	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	31	14,391	3.23	465
IDAHO------------	67	11,300	3.92	443	622	9,851	4.63	456	6,990	15,211	3.71	564
ILLINOIS---------	540	10,664	3.91	416	2,130	9,815	4.68	459	27,823	14,472	3.72	539
INDIANA----------	316	11,595	3.89	451	3,721	10,694	4.76	509	18,427	15,160	3.69	559
IOWA-------------	1,398	10,895	3.93	428	2,353	9,693	4.74	459	27,705	13,984	3.69	516
KANSAS-----------	676	10,579	3.90	413	875	9,567	4.75	454	22,257	14,426	3.58	517
KENTUCKY---------	91	10,321	3.49	360	623	10,222	4.39	449	7,350	14,648	3.55	520
LOUISIANA--------	269	9,727	3.59	349	1,708	9,609	4.24	407	4,985	13,486	3.38	467
MAINE------------	407	12,547	3.85	484	325	10,377	4.62	480	12,939	14,913	3.62	540
MARYLAND---------	425	10,992	4.16	457	1,720	9,753	4.71	460	23,611	15,245	3.70	564
MASSACHUSETTS----	690	11,111	3.90	433	646	10,845	4.51	490	10,022	15,032	3.62	544
MICHIGAN---------	60	11,465	3.95	452	2,210	11,056	4.70	520	36,100	15,182	3.72	565
MINNESOTA--------	873	10,599	3.98	422	3,633	9,916	4.68	464	79,578	14,716	3.69	543
MISSISSIPPI------	250	11,183	3.77	422	517	10,065	4.31	434	2,955	14,575	3.41	497
MISSOURI---------	71	12,283	3.76	462	1,746	10,274	4.60	473	13,504	14,251	3.55	505
MONTANA----------	119	11,188	4.00	447	62	11,866	4.77	566	1,648	14,926	3.59	536
NEBRASKA---------	100	9,836	3.90	383	635	9,728	4.70	457	8,757	14,084	3.66	516
NEVADA-----------	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	281	17,275	3.61	623
NEW HAMPSHIRE----	639	12,756	3.85	491	228	9,643	4.49	433	6,608	14,929	3.64	544
NEW JERSEY-------	31	11,945	3.93	469	431	9,747	4.84	472	10,041	15,371	3.70	569
NEW MEXICO-------	87	11,933	3.56	424	1,984	11,078	4.27	473	4,865	16,014	3.30	529
NEW YORK---------	3,427	11,948	3.92	468	3,100	10,485	4.61	483	121,001	15,303	3.61	552
NORTH CAROLINA---	202	12,702	3.77	479	793	10,123	4.60	466	21,666	15,855	3.58	568
NORTH DAKOTA-----	(1/)	(1/)	(1/)	(1/)	50	9,239	4.74	438	2,720	13,334	3.64	486
OHIO-------------	1,004	12,279	3.86	474	3,517	11,009	4.69	516	35,273	15,754	3.69	581
OKLAHOMA---------	372	11,345	3.80	431	461	11,421	4.48	511	5,755	15,089	3.46	522
OREGON-----------	108	12,643	4.01	507	1,318	10,691	4.64	496	7,500	15,820	3.61	572
PENNSYLVANIA-----	1,483	11,838	4.05	480	6,328	10,279	4.71	485	104,649	15,003	3.78	567
RHODE ISLAND-----	132	11,717	4.00	469	19	7,908	4.25	336	638	14,578	3.66	533
SOUTH CAROLINA---	(1/)	(1/)	(1/)	(1/)	1,848	11,006	4.58	505	5,117	15,333	3.60	552
SOUTH DAKOTA-----	99	11,242	3.86	434	95	10,407	4.58	477	4,443	14,678	3.63	534
TENNESSEE--------	88	11,001	3.85	423	833	9,988	4.44	444	8,724	14,975	3.55	532
TEXAS------------	11	14,140	3.70	522	449	9,137	4.45	406	10,501	15,644	3.46	541
UTAH-------------	6	10,958	3.76	412	22	10,283	4.11	421	7,317	15,719	3.58	562
VERMONT----------	1,553	11,334	3.87	439	453	9,866	4.57	451	22,429	14,470	3.59	519
VIRGINIA---------	472	11,994	3.80	456	2,619	10,264	4.69	481	34,592	15,071	3.61	543
WASHINGTON-------	258	12,687	3.97	503	2,263	11,385	4.69	534	17,318	16,421	3.61	593
WEST VIRGINIA----	99	10,601	3.72	394	314	9,070	4.64	421	6,180	14,969	3.53	529
WISCONSIN--------	703	11,019	3.99	440	7,185	10,059	4.70	473	103,057	14,854	3.82	568
WYOMING----------	6	8,237	3.55	292	23	12,505	4.54	566	466	14,523	3.42	497
UNITED STATES----	18,721	11,578	3.91	453	65,631	10,397	4.62	481	967,469	15,211	3.66	557

1/ NO LACTATION RECORDS REPORTED.

TABLE 2.--STATE AND NATIONAL STANDARDIZED LACTATION AVERAGES FOR JERSEY, BROWN SWISS, AND MILKING SHORTHORN COWS ON OFFICIAL TEST, CALVING IN 1974 1/

	JERSEY				BROWN SWISS				MILKING SHORTHORN			
STATE	RECORDS	MILK	FAT	FAT	RECORDS	MILK	FAT	FAT	RECORDS	MILK	FAT	FAT
	NO.	LB	PCT	LB	NO.	LB	PCT	LB	NO.	LB	PCT	LB
ALABAMA----------	1,956	10,567	4.76	503	199	12,217	3.94	481	(1/)	(1/)	(1/)	(1/)
ALASKA-----------	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)
ARIZONA----------	956	10,092	4.84	489	606	15,376	3.96	609	20	10,322	3.58	370
ARKANSAS---------	557	9,050	4.82	436	6	10,585	3.40	358	110	12,464	3.52	439
CALIFORNIA-------	5,462	10,293	5.07	522	482	13,635	4.04	551	113	11,429	3.57	408
COLORADO---------	276	9,999	4.92	491	262	14,568	4.05	590	28	10,573	3.82	404
CONNECTICUT------	350	10,086	5.01	505	318	13,630	3.98	542	1	10,180	3.99	406
DELAWARE---------	(1/)	(1/)	(1/)	(1/)	7	14,824	4.33	642	(1/)	(1/)	(1/)	(1/)
FLORIDA----------	1,543	9,139	4.48	409	586	12,157	3.67	446	1	8,770	3.57	313
GEORGIA----------	1,357	9,285	5.05	469	394	12,607	3.80	479	(1/)	(1/)	(1/)	(1/)
HAWAII-----------	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)
IDAHO------------	1,000	10,162	4.84	492	57	11,834	3.88	459	25	13,590	3.52	478
ILLINOIS---------	1,293	9,046	5.07	458	1,243	12,142	4.11	499	67	10,326	3.75	387
INDIANA----------	1,164	8,957	5.06	453	804	13,627	4.05	552	61	9,900	3.82	378
IOWA-------------	1,769	9,405	4.99	469	2,527	12,592	4.07	512	379	10,202	3.67	375
KANSAS-----------	571	9,318	4.90	457	341	11,908	3.99	476	8	10,385	3.65	379
KENTUCKY---------	1,943	9,789	4.80	470	297	12,290	3.74	460	(1/)	(1/)	(1/)	(1/)
LOUISIANA--------	1,733	8,903	4.57	407	94	10,555	3.64	385	(1/)	(1/)	(1/)	(1/)
MAINE------------	1,170	10,636	4.87	518	90	11,371	4.04	459	79	7,951	3.56	283
MARYLAND---------	592	8,414	5.06	425	322	12,579	3.97	499	40	9,248	3.72	344
MASSACHUSETTS----	953	9,641	4.96	478	68	12,317	3.76	465	23	9,992	3.56	355
MICHIGAN---------	1,804	9,231	5.02	464	306	12,208	4.10	501	11	10,800	3.75	405
MINNESOTA--------	1,796	9,454	4.90	463	1,319	12,403	4.02	498	462	11,100	3.69	410
MISSISSIPPI------	1,918	9,814	4.74	465	20	12,252	4.00	491	(1/)	(1/)	(1/)	(1/)
MISSOURI---------	1,287	9,383	5.00	469	570	11,459	3.88	445	131	10,546	3.80	401
MONTANA----------	25	7,100	5.15	365	43	14,695	3.96	581	(1/)	(1/)	(1/)	(1/)
NEBRASKA---------	184	9,224	4.98	459	480	11,707	4.16	487	185	9,101	3.63	331
NEVADA-----------	467	12,265	4.90	601	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)
NEW HAMPSHIRE----	963	10,141	4.86	493	69	10,174	3.91	398	(1/)	(1/)	(1/)	(1/)
NEW JERSEY-------	353	10,949	4.79	524	236	12,006	4.03	484	(1/)	(1/)	(1/)	(1/)
NEW MEXICO-------	150	10,220	4.86	496	106	12,297	3.83	471	2	5,330	2.97	159
NEW YORK---------	3,570	9,885	4.97	491	1,573	12,745	3.95	503	37	9,595	3.53	338
NORTH CAROLINA---	1,781	9,747	4.84	472	176	11,878	3.99	472	2	8,995	4.16	374
NORTH DAKOTA-----	16	7,243	4.49	325	131	11,860	4.11	488	24	10,825	3.53	382
OHIO-------------	3,906	9,796	5.03	492	1,340	14,093	4.10	578	142	10,087	3.79	382
OKLAHOMA---------	681	9,429	4.88	460	205	12,011	3.91	470	169	10,875	3.44	374
OREGON-----------	2,867	10,455	5.04	527	643	13,324	4.03	537	27	9,180	3.96	361
PENNSYLVANIA-----	3,434	9,397	5.06	475	858	13,188	4.12	543	70	10,347	3.71	384
RHODE ISLAND-----	39	11,306	5.36	606	2	8,425	3.86	326	(1/)	(1/)	(1/)	(1/)
SOUTH CAROLINA---	2,814	11,423	4.89	559	68	13,026	3.86	504	1	14,960	2.92	437
SOUTH DAKOTA-----	114	9,467	5.13	485	382	11,076	4.07	451	44	8,383	3.66	306
TENNESSEE--------	3,382	10,263	4.79	492	324	13,180	3.93	518	(1/)	(1/)	(1/)	(1/)
TEXAS------------	2,534	9,805	4.75	466	795	13,693	3.83	525	(1/)	(1/)	(1/)	(1/)
UTAH-------------	1,024	10,003	4.81	482	17	14,256	4.14	590	(1/)	(1/)	(1/)	(1/)
VERMONT----------	4,936	9,707	4.90	476	277	13,662	3.92	535	21	11,619	3.38	393
VIRGINIA---------	822	10,208	4.91	502	217	10,986	4.03	443	3	10,990	3.63	396
WASHINGTON-------	2,648	10,808	5.02	542	344	14,701	3.98	585	19	12,788	3.40	435
WEST VIRGINIA----	371	10,479	4.96	519	20	11,166	3.98	445	(1/)	(1/)	(1/)	(1/)
WISCONSIN--------	2,182	9,224	5.02	463	2,028	12,521	4.06	508	289	10,151	3.71	376
WYOMING----------	67	8,573	5.15	441	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)	(1/)
UNITED STATES----	70,780	9,888	4.92	486	21,252	12,806	4.00	513	2,595	10,421	3.66	381

1/ NO LACTATION RECORDS REPORTED.

DISTRIBUTION OF ACTIVE ARTIFICIAL INSEMINATION (AI) SIRES SUMMARIZED BY LEVEL OF PREDICTED DIFFERENCE FOR MILK AND DOLLARS 1/

The average production of daughters and daughters' herdmates of all active AI sires, summarized in the Spring 1976 USDA-DHIA Sire Summary List, were categorized by breed of sire and grouped in table 1 according to the range of the sires' Predicted Difference (PD) for milk and in table 2 according to the range of the sires' PD for dollars.

The average PD's for milk and dollars by breeds for 2 years were as follows:

Breed	Spring 1975 Milk Lb	Spring 1976 Milk Lb	Spring 1975 Dollars	Spring 1976 Dollars
Ayrshire	520	516	42	44
Guernsey	387	428	34	37
Holstein	416	500	30	37
Jersey	490	557	41	48
Brown Swiss	438	440	39	38
Milking Shorthorn	758	745	63	65
Average	425	501	33	37

The average PD milk of 425 for 1975 vs. 501 for 1976 indicates that PD's have increased.

Table 1 shows that in the Spring 1976 Sire Summary, the number of bulls in each breed with PD's for milk of +400 pounds or higher were as follows: 13 of 22 Ayrshires, 38 of 73 Guernseys, 489 of 838 Holsteins, 75 of 103 Jerseys, 18 of 37 Brown Swiss, and all 8 Milking Shorthorns. The data also indicate that with the exception of one group, the bulls with average milk PD's above zero have average fat PD's above zero.

Interpretation of Data

A zero Predicted Difference in tables 1 and 2 indicates that a sire with zero PD, used in breed average herds, has about one-half of his daughters above and about one-half below breed average. He can be expected to transmit somewhat less than breed-average production to his future progeny because of genetic improvement across the years. In general, the bulls with minus PD's

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1/ Prepared by Gerald J. King, dairy husbandman, and James H. Grove, computer programmer, of the Animal Improvement Programs Laboratory, Animal Physiology and Genetics Institute, Northeastern Region, ARS, USDA, Beltsville, Md. 20705.

sire daughters more than 50 percent of which are below breed average in production. Bulls with higher PD's are expected to sire daughters with higher production than bulls with lower PD's regardless of herd production level.

What These Data Mean to Dairymen

Dairymen who derive most of their income from the sale of milk should, of course, be using sires with high plus PD's. These tables indicate that the availability of AI sires with plus PD's is sufficient in all breeds to fulfill the requirements of the industry for a pool of germ plasm that will assure a steady increase in production in future generations. The distribution of PD's shown in table 1 indicate that a great deal more selection for increased production could be practiced. For instance, 12.2 percent of sires in all breeds have PD's for milk below zero. This figure has been reduced from 25.9 percent in January 1972. If these sires are used in breed average herds, the probability that they will transmit at least breed average milk production to their daughters is less than 50 percent. 2/ The use of bulls with minus or zero PD's should be avoided. Dairymen should be aware that if they use such bulls to breed cows in the same environment, most can expect to have lower herd averages in the future.

On the other hand, 59 percent of the bulls have PD's for milk production of 400 pounds or above. Assuming a repeatability of 60 percent, the probability that such a bull will transmit above-breed-average production to his daughters is at least 87 percent. 2/ Thus, these bulls will raise milk production in most herds.

A minimum of six sires in each breed has a PD for milk of 600 pounds or above. For the six breeds listed, 442 such sires were included in the Spring 1976 summary. This number would be enough to breed nearly all of the approximately 50 percent of dairy cows presently being bred to AI bulls in the nation each year. According to the USDA procedure 3/ for calculating PD for income, it can be shown that these bulls produce milk valued at $69 higher than the milk expected from their breed average herdmates.

2/ April 1968 Dairy Herd Improvement Letter, ARS 44-202 pp. 21-23.

3/ January 1971 Dairy Herd Improvement Letter, ARS 44-223.

TABLE 1.--AVERAGE PRODUCTION OF MILK AND MILK-FAT OF DAUGHTERS OF SIRES IN ACTIVE AI SERVICE, GROUPED ACCORDING TO RANGE OF PREDICTED DIFFERENCE FOR MILK, SPRING 1976

PRED. DIFF. MILK RANGE	SIRES IN GROUP	SIRES IN GROUP	DAUGHTERS W/HM	DAUGHTER RECORDS	AVERAGE PRODUCTION						PREDICTED DIFFERENCES			
					DAUGHTERS			HERDMATES						
					MILK	FAT	FAT	MILK	FAT	FAT	MILK	FAT	FAT	$
	NO.	PCT	NO.	NO.	LB	PCT	LB	LB	PCT	LB	LB	PCT	LB	
AYRSHIRE														
+1200 TO +1399	1	4.5	179	298	11,710	3.7	438	10,625	3.8	408	+1,248	-.12	+35	+98
+1000 TO +1199	4	18.2	1,068	1,973	12,949	3.8	494	12,001	3.9	468	+1,102	-.09	+33	+89
+800 TO +999	1	4.5	99	236	11,797	3.8	452	11,396	3.9	444	+876	-.09	+24	+68
+600 TO +799	3	13.6	527	841	11,924	3.9	470	11,398	4.0	454	+676	-.05	+21	+55
+400 TO +599	4	18.2	512	1,016	11,711	4.0	465	11,551	3.9	455	+538	.00	+21	+48
+200 TO +399	3	13.6	2,817	5,594	11,465	3.9	449	11,572	3.9	451	+297	-.02	+10	+25
0 TO +199	4	18.2	2,717	5,388	11,089	4.0	445	11,344	3.9	445	+108	+.07	+12	+17
-199 TO -1	1	4.5	154	265	12,540	3.9	492	12,723	3.9	496	-171	+.05	-2	-11
-599 TO -400	1	4.5	536	1,111	10,484	4.1	426	11,198	3.9	439	-508	+.12	-8	-34
TOTAL OR SIRE AVG.	22		8,609	16,722	11,804	3.9	463	11,565	3.9	453	+516	-.02	+18	+44
GUERNSEY														
+1200 TO +1399	2	2.7	200	322	11,458	4.4	506	10,314	4.6	471	+1,210	-.17	+39	+100
+1000 TO +1199	3	4.1	764	1,262	11,606	4.3	501	10,318	4.6	471	+1,077	-.21	+29	+84
+800 TO +999	4	5.5	1,993	4,103	11,659	4.6	532	10,736	4.6	497	+881	-.07	+35	+79
+600 TO +799	13	17.8	3,610	6,207	11,183	4.6	513	10,594	4.7	495	+709	-.09	+25	+60
+400 TO +599	16	21.9	2,671	4,987	11,127	4.6	508	10,708	4.6	492	+515	-.02	+22	+47
+200 TO +399	12	16.4	8,534	18,352	11,116	4.7	522	10,864	4.7	511	+319	.00	+15	+31
0 TO +199	17	23.3	3,895	8,169	10,245	4.6	471	10,360	4.6	478	+115	-.03	+3	+9
-199 TO -1	4	5.5	233	382	9,567	4.7	451	10,007	4.6	461	-131	+.06	-1	-8
-399 TO -200	1	1.4	15	15	10,056	4.7	470	11,076	4.5	501	-212	+.07	-4	-15
-599 TO -400	1	1.4	11	14	9,202	4.6	424	10,619	4.7	501	-400	-.03	-22	-41
TOTAL OR SIRE AVG.	73		21,926	43,813	10,861	4.6	499	10,573	4.6	490	+428	-.04	+16	+37
HOLSTEIN														
+2000 AND UP	2	.2	324	611	17,641	3.6	628	15,352	3.7	562	+2,128	-.13	+56	+164
+1800 TO +1999	1	.1	64	84	16,694	3.4	563	15,121	3.6	540	+1,977	-.22	+36	+138
+1600 TO +1799	8	1.0	1,555	2,884	17,012	3.6	604	15,504	3.6	561	+1,683	-.11	+44	+129
+1400 TO +1599	10	1.2	25,082	51,381	16,860	3.5	589	15,449	3.6	560	+1,491	-.15	+31	+107
+1200 TO +1399	22	2.6	17,432	30,782	16,635	3.5	585	15,511	3.6	560	+1,291	-.12	+28	+94
+1000 TO +1199	62	7.4	69,093	151,388	16,419	3.5	582	15,495	3.6	558	+1,091	-.08	+27	+82
+800 TO +999	92	11.0	99,308	195,736	16,242	3.6	582	15,562	3.6	565	+889	-.08	+21	+66
+600 TO +799	145	17.3	67,987	128,282	16,150	3.6	579	15,686	3.6	569	+692	-.07	+15	+50
+400 TO +599	147	17.5	90,635	176,762	15,676	3.6	567	15,475	3.6	562	+506	-.05	+11	+37
+200 TO +399	152	18.1	39,170	72,106	15,536	3.6	563	15,561	3.6	566	+305	-.05	+4	+20
0 TO +199	89	10.6	32,456	59,863	15,133	3.7	555	15,465	3.6	563	+110	-.01	+3	+9
-199 TO -1	62	7.4	18,098	33,940	14,855	3.7	547	15,522	3.6	564	-90	.00	-3	-8
-399 TO -200	27	3.2	3,632	7,566	15,182	3.7	560	16,102	3.7	588	-285	.00	-10	-24
-599 TO -400	12	1.4	3,061	4,594	13,792	3.7	510	14,931	3.7	546	-498	.00	-18	-43
-799 TO -600	6	.7	1,555	2,930	13,977	3.7	522	15,517	3.6	565	-707	+.06	-18	-54
-999 TO -800	1	.1	14	14	12,842	4.1	528	15,513	3.7	579	-825	+.13	-13	-56
TOTAL OR SIRE AVG.	838		469,466	918,923	15,731	3.6	568	15,554	3.6	565	+500	-.05	+11	+37
JERSEY														
+1200 TO +1399	1	1.0	46	53	10,836	4.7	511	9,817	5.0	486	+1,279	-.27	+37	+102
+1000 TO +1199	7	6.8	420	643	11,330	4.8	544	10,591	4.9	520	+1,076	-.20	+35	+89
+800 TO +999	23	22.3	1,729	3,219	11,096	4.9	541	10,463	4.9	516	+896	-.12	+34	+79
+600 TO +799	22	21.4	7,061	13,202	10,566	4.9	521	10,198	4.9	504	+705	-.07	+29	+64
+400 TO +599	22	21.4	2,679	5,034	10,178	4.9	501	10,141	5.0	502	+507	-.09	+17	+42
+200 TO +399	10	9.7	582	1,069	10,554	5.0	523	10,433	5.0	518	+318	-.04	+12	+28
0 TO +199	6	5.8	764	1,623	9,690	5.0	482	10,072	5.0	503	+95	-.05	0	+5
-199 TO -1	6	5.8	140	270	8,698	5.0	437	9,249	4.9	451	-131	+.04	-3	-10
-399 TO -200	5	4.9	143	226	9,271	4.9	450	10,080	4.8	488	-245	-.02	-14	-26
-599 TO -400	1	1.0	43	72	8,044	5.1	413	8,637	5.1	437	-458	+.07	-17	-40
TOTAL OR SIRE AVG.	103		13,607	25,411	10,408	4.9	511	10,207	4.9	504	+557	-.09	+20	+48

TABLE 1.--AVERAGE PRODUCTION OF MILK AND MILK-FAT OF DAUGHTERS OF SIRES IN ACTIVE AI SERVICE, GROUPED ACCORDING TO RANGE OF PREDICTED DIFFERENCE FOR MILK, SPRING 1976--CONTINUED

PRED. DIFF. MILK RANGE	SIRES IN GROUP	SIRES IN GROUP	DAUGHTERS W/HM	DAUGHTER RECORDS	AVERAGE PRODUCTION DAUGHTERS MILK	FAT	FAT	HERDMATES MILK	FAT	FAT	PREDICTED DIFFERENCES MILK	FAT	FAT	$
	NO.	PCT	NO.	NO.	LB	PCT	LB	LB	PCT	LB	LB	PCT	LB	
					BROWN SWISS									
+1800 TO +1999	1	2.7	55	93	14,846	3.8	564	13,265	3.9	523	+1,902	-.16	+55	+151
+1400 TO +1599	1	2.7	107	215	12,531	4.2	522	11,122	4.0	450	+1,510	+.06	+69	+143
+1000 TO +1199	3	8.1	731	1,182	13,866	4.0	561	13,197	4.1	536	+1,092	-.05	+37	+92
+800 TO +999	2	5.4	222	412	13,530	4.1	555	12,837	4.0	515	+913	+.05	+43	+88
+600 TO +799	3	8.1	272	567	12,604	4.1	521	12,360	4.1	507	+640	-.01	+25	+57
+400 TO +599	8	21.6	269	563	13,488	4.1	551	13,095	4.1	535	+466	-.01	+18	+41
+200 TO +399	7	18.9	676	1,033	13,071	4.0	529	13,158	4.0	531	+324	-.04	+8	+24
0 TO +199	8	21.6	572	1,023	12,971	4.1	527	13,230	4.1	540	+89	-.01	+2	+7
-199 TO -1	2	5.4	514	1,005	12,187	4.1	501	12,696	4.0	511	-80	+.04	+2	-2
-399 TO -200	2	5.4	91	161	11,717	4.1	484	13,337	4.0	539	-339	+.05	-8	-25
TOTAL OR SIRE AVG.	37		3,509	6,254	13,103	4.1	533	13,014	4.1	528	+440	-.01	+16	+38
					MILKING SHORTHORN									
+1200 TO +1399	1	12.5	94	186	11,556	3.8	444	10,736	3.8	403	+1,246	+.07	+53	+115
+800 TO +999	2	25.0	154	248	11,164	3.6	403	10,507	3.7	387	+823	-.05	+25	+66
+600 TO +799	3	37.5	100	204	11,445	3.7	423	10,676	3.6	388	+701	+.03	+29	+64
+400 TO +599	2	25.0	94	184	10,653	3.7	391	10,264	3.7	381	+483	-.01	+17	+41
TOTAL OR SIRE AVG.	8		442	822	11,190	3.7	413	10,538	3.7	388	+745	+.01	+28	+65
AVERAGE PRODUCTION AND PRED. DIFF. VALUES ACROSS ALL SIRES	1,081		517,559	1,011,945	14,691	3.8	554	14,503	3.8	549	+501	-.04	+12	+37

TABLE 2.--AVERAGE PRODUCTION OF MILK AND MILK-FAT OF DAUGHTERS OF SIRES IN ACTIVE AI SERVICE, GROUPED ACCORDING TO RANGE OF PREDICTED DIFFERENCE FOR DOLLARS, SPRING 1976

PRED. DIFF. DOLLAR RANGE	SIRES IN GROUP	SIRES IN GROUP	DAUGHTERS W/HM	DAUGHTER RECORDS	AVERAGE PRODUCTION						PREDICTED DIFFERENCES			
					DAUGHTERS			HERDMATES						
					MILK	FAT	FAT	MILK	FAT	FAT	MILK	FAT	FAT	$
	NO.	PCT	NO.	NO.	LB	PCT	LB	LB	PCT	LB	LB	PCT	LB	
					AYRSHIRE									
+80 TO +99	4	18.2	577	995	12,725	3.8	485	11,658	3.9	452	+1,139	-.08	+36	+93
+60 TO +79	4	18.2	882	1,689	12,115	3.9	474	11,510	3.9	454	+835	-.05	+27	+69
+40 TO +59	4	18.2	824	1,517	11,815	3.9	462	11,593	3.9	458	+598	-.05	+18	+48
+20 TO +39	4	18.2	2,439	4,597	11,482	4.0	457	11,651	3.9	457	+315	+.02	+15	+30
0 TO +19	4	18.2	3,197	6,548	11,030	4.0	438	11,217	3.9	439	+121	+.03	+8	+14
-19 TO -1	1	4.5	154	265	12,540	3.9	492	12,723	3.9	496	-171	+.05	-2	-11
-39 TO -20	1	4.5	536	1,111	10,484	4.1	426	11,198	3.9	439	-508	+.12	-8	-34
TOTAL OR SIRE AVG.	22		8,609	16,722	11,804	3.9	463	11,565	3.9	453	+516	-.02	+18	+44
					GUERNSEY									
+100 TO +119	1	1.4	73	105	11,293	4.4	500	10,119	4.5	451	+1,209	-.09	+48	+108
+80 TO +99	7	9.6	1,792	2,873	11,581	4.6	528	10,574	4.6	490	+967	-.07	+38	+86
+60 TO +79	7	9.6	3,266	5,959	10,721	4.5	483	10,071	4.6	463	+787	-.07	+30	+69
+40 TO +59	22	30.1	4,521	8,506	11,103	4.6	514	10,637	4.7	496	+561	-.04	+23	+51
+20 TO +39	13	17.8	8,430	18,548	11,306	4.6	517	11,050	4.6	512	+347	-.05	+12	+29
0 TO +19	16	21.9	3,369	6,979	10,389	4.6	477	10,445	4.6	482	+124	-.03	+3	+9
-19 TO -1	6	8.2	464	829	9,798	4.7	457	10,295	4.6	476	-107	+.01	-4	-9
-59 TO -40	1	1.4	11	14	9,202	4.6	424	10,619	4.7	501	-400	-.03	-22	-41
TOTAL OR SIRE AVG.	73		21,926	43,813	10,861	4.6	499	10,573	4.6	490	+428	-.04	+16	+37
					HOLSTEIN									
+160 TO +179	1	.1	30	30	18,797	3.6	676	15,978	3.6	577	+2,128	-.05	+70	+177
+140 TO +159	3	.4	12,127	25,880	17,030	3.6	612	15,420	3.6	560	+1,796	-.07	+54	+145
+120 TO +139	9	1.1	12,985	25,325	16,778	3.6	598	15,373	3.6	556	+1,663	-.10	+45	+129
+100 TO +119	19	2.3	31,461	80,535	17,004	3.6	614	15,755	3.6	568	+1,314	-.05	+40	+106
+80 TO +99	60	7.2	60,857	108,978	16,310	3.6	584	15,422	3.6	557	+1,117	-.06	+31	+87
+60 TO +79	111	13.2	102,805	206,944	16,113	3.6	581	15,441	3.6	561	+885	-.05	+24	+69
+40 TO +59	184	22.0	99,044	191,025	16,110	3.6	581	15,691	3.6	570	+644	-.05	+16	+49
+20 TO +39	191	22.8	90,074	172,732	15,671	3.6	567	15,544	3.6	566	+423	-.05	+8	+30
0 TO +19	139	16.6	37,880	69,422	15,263	3.6	552	15,454	3.6	562	+201	-.05	0	+11
-19 TO -1	75	8.9	13,217	21,811	15,074	3.6	546	15,705	3.6	570	-42	-.04	-7	-9
-39 TO -20	29	3.5	7,557	14,005	14,661	3.6	534	15,661	3.6	571	-279	-.02	-13	-27
-59 TO -40	15	1.8	860	1,516	13,904	3.7	515	15,154	3.7	555	-532	-.01	-21	-47
-79 TO -60	1	.1	14	14	14,098	3.6	511	16,511	3.6	593	-747	+.02	-24	-62
-99 TO -80	1	.1	555	706	14,065	3.5	494	14,766	3.6	533	-744	-.13	-44	-80
TOTAL OR SIRE AVG.	838		469,466	918,923	15,731	3.6	568	15,554	3.6	565	+500	-.05	+11	+37
					JERSEY									
+100 TO +119	3	2.9	280	449	11,407	5.0	572	10,563	5.0	527	+1,111	-.06	+50	+105
+80 TO +99	17	16.5	2,568	4,868	11,131	4.9	549	10,503	4.9	519	+957	-.11	+38	+85
+60 TO +79	29	28.2	4,000	6,922	10,705	4.9	522	10,248	4.9	504	+778	-.10	+30	+69
+40 TO +59	15	14.6	3,571	7,069	10,211	4.9	505	10,059	5.0	501	+568	-.09	+20	+48
+20 TO +39	21	20.4	2,187	4,316	10,459	4.9	511	10,351	4.9	511	+401	-.10	+11	+31
0 TO +19	4	3.9	602	1,136	9,570	4.9	468	9,792	4.9	482	+170	-.07	+2	+11
-19 TO -1	7	6.8	168	301	8,799	5.1	446	9,459	4.9	463	-111	+.04	-2	-8
-39 TO -20	6	5.8	188	278	9,561	4.8	460	10,275	4.9	502	-196	-.07	-16	-25
-59 TO -40	1	1.0	43	72	8,044	5.1	413	8,637	5.1	437	-458	+.07	-17	-40
TOTAL OR SIRE AVG.	103		13,607	25,411	10,408	4.9	511	10,207	4.9	504	+557	-.09	+20	+48

TABLE 2.--AVERAGE PRODUCTION OF MILK AND MILK-FAT OF DAUGHTERS OF SIRES IN ACTIVE AI SERVICE, GROUPED ACCORDING TO RANGE OF PREDICTED DIFFERENCE FOR DOLLARS, SPRING 1976--CONTINUED

PRED. DIFF. DOLLAR RANGE	SIRES IN GROUP	SIRES IN GROUP	DAUGHTERS W/HM	DAUGHTER RECORDS	AVERAGE PRODUCTION						PREDICTED DIFFERENCES			
					DAUGHTERS			HERDMATES						
					MILK	FAT	FAT	MILK	FAT	FAT	MILK	FAT	FAT	$
	NO.	PCT	NO.	NO.	LB	PCT	LB	LB	PCT	LB	LB	PCT	LB	
					BROWN SWISS									
+140 TO +159	2	5.4	162	308	13,689	4.0	543	12,194	4.0	487	+1,706	-.05	+62	+147
+80 TO +99	5	13.5	953	1,594	13,732	4.1	558	13,053	4.0	528	+1,020	-.02	+39	+90
+60 TO +79	1	2.7	109	253	12,847	4.3	548	12,638	4.1	517	+601	+.13	+40	+69
+40 TO +59	7	18.9	363	731	13,312	4.1	547	12,986	4.1	529	+518	+.01	+22	+48
+20 TO +39	9	24.3	543	938	13,009	4.1	531	13,003	4.1	531	+368	-.02	+12	+30
0 TO +19	9	24.3	949	1,775	13,060	4.0	529	13,175	4.1	536	+116	-.02	+2	+8
-19 TO -1	3	8.1	420	644	12,045	4.1	490	12,759	4.0	512	-145	+.02	-3	-10
-59 TO -40	1	2.7	10	11	12,003	4.0	479	14,425	4.1	587	-364	-.07	-23	-40
TOTAL OR SIRE AVG.	37		3,509	6,254	13,103	4.1	533	13,014	4.1	528	+440	-.01	+16	+38
					MILKING SHORTHORN									
+100 TO +119	1	12.5	94	186	11,556	3.8	444	10,736	3.8	403	+1,246	+.07	+53	+115
+60 TO +79	4	50.0	235	416	11,221	3.7	411	10,591	3.6	386	+771	.00	+28	+66
+40 TO +59	2	25.0	74	130	11,093	3.7	415	10,345	3.8	389	+584	+.02	+23	+52
+20 TO +39	1	12.5	39	90	10,895	3.5	384	10,518	3.6	380	+464	-.05	+12	+36
TOTAL OR SIRE AVG.	8		442	822	11,190	3.7	413	10,538	3.7	388	+745	+.01	+28	+65

OFFICIAL LACTATION RECORDS RECEIVED BY USDA IN 1974 AND 1975, BY STATE WITH SUMMARY OF ERRORS, CONFLICTS, AND SIRE IDENTIFICATION 1/

A total of 2,498,687 Official DHI and DHIR lactation records were reported to USDA in 1974, and 2,444,865 Official DHI and DHIR lactation records were reported in 1975, for use in research involving the genetic evaluation of dairy bulls and cows. The number reported for each State during these 2 years is shown in table 1. They include records for the USDA-DHIA Sire Summary runs of May 1974, September 1974, and January 1975 for calendar year 1974 and records for the runs of Spring 1975, Fall 1975, and Winter 1976 for calendar year 1975.

Records Reported But Not Used In Genetic Evaluation, 1975

Of the 2,444,865 official lactation records submitted to USDA in 1975, the following were not used for genetic evaluation of bulls and cows:

Edit and reason for rejection	Number	Percent of records submitted
Preliminary edit -- Grade Sire number all zeros -----------------	1,054,642	43.137
Registered Sire number all zeros ----------	3,582	.147
Other invalid data items --	51,171	2.093
Main edit -- Conflicts with another record --------------------	145,029	5.932
Total	1,254,424	51.309

Tables 2 and 3 show errors and conflicts noted in 1974 and 1975 respectively, rather than the number of records in error. As many as four errors or conflicts or both may be coded for a single record. In table 2,

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1/ Prepared by Gerald J. King, dairy husbandman, Linda F. Randall, computer programmer, Maureen K. Dixon, computer technician, and Evelyn F. Myers, clerk, of the Animal Improvement Programs Laboratory, Animal Physiology and Genetics Institute, Northeastern Region, ARS, USDA, Beltsville, Md. 20705.

missing identification numbers for sires of grade cows caused rejection of 1,096,140 records compared with 1,042,306 in 1973; the next most frequent cause of rejection was blanks in any position of the record. No errors or conflicts are shown for main edit, because a main edit was not run in January 1975. Missing identification for sires of grade cows decreased to 1,054,642. The next most frequent cause of rejection was cow number all zeros.

The records rejected during the main edit are returned to the appropriate processing center for correction.

Increased care in identifying (including the reporting of sire and dam numbers) and reporting all animals in each herd would greatly increase the number of records used for bull and cow evaluation.

Sire Identification in Official Lactation Records, 1974 and 1975, by State

Table 4 shows the numbers and percentages of reported sire numbers that were nonzero and zero for 1974 and 1975, but State. Some States' year-to-year comparisons may not be appropriate because of large fluctuations in the number of records reported from year to year.

In 1975, missing sire identification (ID) continued to be the main reason why many Official DHI and DHIR records are not useful in sire and cow evaluation.

Summary of Official Lactation Records Received by USDA Since 1957

Table 5 shows a summary of the numbers of official lactation records received since 1957. The number of records received annually has increased from just over one-half of a million in 1957 to nearly 2 1/2 million in 1973. The percentage of Official DHI and DHIR cows represented has increased from 38.2 percent in 1957 to 101.2 percent in 1975, when 2,417,008 cows were enrolled (exclusive of records from Puerto Rico), and 2,444,865 records were received. Percentages exceeding 100 are possible because of varying reporting and processing procedures.

Table 5 also shows the trend between 1969 and 1975 in percentage of Official DHI and DHIR lactations reported to USDA with missing sire ID, losses due to other errors found in editing, and the number of records used. There has been an undesirable increase in the proportion of cows without sire ID since 1970. However, there is a continuing increase in the number of records that contain valid sire ID for use in genetic evaluation.

TABLE 1.-- LACTATION RECORDS RECEIVED BY USDA IN 1974 AND 1975 FOR BULL AND COW EVALUATION 1/

STATE	1974 LACTATION RECORDS: OFFICIAL DHI AND DHIR COWS ON TEST 1-1-74	1974 LACTATION RECORDS: RECEIVED	1974 LACTATION RECORDS: PERCENTAGE OF COWS ENROLLED IN OFFICIAL DHI AND DHIR 2/	1975 LACTATION RECORDS: OFFICIAL DHI AND DHIR COWS ON TEST 1-1-75	1975 LACTATION RECORDS: RECEIVED	1975 LACTATION RECORDS: PERCENTAGE OF COWS ENROLLED IN OFFICIAL DHI AND DHIR 2/
	NO.	NO.		NO.	NO.	
ALABAMA----------	30,401	30,560	100.5	28,744	23,572	82.0
ALASKA-----------	42	59	140.5	44	44	100.0
ARIZONA----------	28,931	29,937	103.5	32,170	32,502	101.0
ARKANSAS---------	7,149	8,686	121.5	7,053	7,959	112.8
CALIFORNIA-------	412,814	355,091	86.0	359,834	362,190	100.7
COLORADO---------	23,667	22,711	96.0	24,633	23,903	97.0
CONNECTICUT------	21,780	22,230	102.1	22,174	22,972	103.6
DELAWARE---------	3,722	3,221	86.5	3,226	3,542	109.8
FLORIDA----------	17,354	29,111	167.7	17,878	24,568	137.4
GEORGIA----------	34,136	37,115	108.7	33,317	31,888	95.7
HAWAII-----------	4,814	4,880	101.4	5,444	4,072	74.8
IDAHO------------	25,284	31,918	126.2	31.097	26,194	84.2
ILLINOIS---------	56,733	60,880	107.3	58,049	62,770	108.1
INDIANA----------	43,434	48,204	111.0	45,414	41,250	90.8
IOWA-------------	66,356	84,633	127.5	68,542	76,627	111.7
KANSAS-----------	45,759	59,457	129.9	47,025	50,944	108.3
KENTUCKY---------	24,722	26,091	105.5	25,552	22,016	86.2
LOUISIANA--------	22,420	27,093	120.8	28,503	23,791	83.5
MAINE------------	19,197	20,884	108.8	18,440	20,930	113.5
MARYLAND---------	48,282	45,216	93.6	47,968	45,955	95.8
MASSACHUSETTS----	19,088	19,962	104.6	17,102	19,798	115.8
MICHIGAN---------	86,133	65,909	76.5	87,636	149,139	170.1
MINNESOTA--------	146,286	165,271	113.0	152,364	159,005	104.4
MISSISSIPPI------	21,728	21,692	99.8	22,032	17,219	78.2
MISSOURI---------	39,828	51,336	128.9	41,102	45,388	110.4
MONTANA----------	5,524	4,803	86.9	5,005	4,834	96.6
NEBRASKA---------	26,209	33,627	128.3	26,221	28,130	107.3
NEVADA-----------	6,357	6,475	101.9	7,749	6,962	89.8
NEW HAMPSHIRE----	11,219	11,492	102.4	10,581	12,217	115.5
NEW JERSEY-------	16,755	16,925	101.0	16,296	17,396	106.8
NEW MEXICO-------	15,391	15,769	102.5	13,079	19,855	151.8
NEW YORK---------	188,836	189,527	100.4	191,286	192,343	100.6
NORTH CAROLINA---	57,949	63,833	110.2	58,207	52,777	90.7
NORTH DAKOTA-----	6,733	7,928	117.7	6,701	7,613	113.6
OHIO-------------	90,752	83,607	92.1	88,011	84,924	96.5
OKLAHOMA---------	27,589	32,176	116.6	26,370	28,223	107.2
OREGON-----------	28,537	37,696	132.1	37,328	30,575	81.9
PENNSYLVANIA-----	157,026	152,137	96.9	166,167	160,750	96.7
RHODE ISLAND-----	1,324	1,232	93.1	1,324	1,377	104.0
SOUTH CAROLINA---	28,698	30,241	105.4	29,664	25,369	85.5
SOUTH DAKOTA-----	8,819	11,659	132.2	10,262	11,439	111.5
TENNESSEE--------	38,382	39,497	102.9	38,474	33,325	86.6
TEXAS------------	35,096	39,687	113.1	40,055	31,817	79.4
UTAH-------------	32,724	32,193	98.4	33,008	32,104	97.3
VERMONT----------	41,126	42,277	102.8	42,741	43,901	102.7
VIRGINIA---------	68,053	74,786	109.9	73,139	66,119	90.4
WASHINGTON-------	64,929	76,539	117.9	64,620	57,544	89.0
WEST VIRGINIA----	12,040	11,286	93.7	12,016	13,611	113.3
WISCONSIN--------	180,930	208,534	115.3	191,057	180,267	94.4
WYOMING----------	3,100	2,614	84.3	2,304	3,155	136.9
UNITED STATES----	3/ 2,404,158	2,498,687	103.9	4/ 2,417,008	2,444,865	101.2

1/ LACTATION RECORD INPUT FOR USDA-DHIA SIRE SUMMARY RUNS FOR MAY 1974, SEPTEMBER 1974, AND JANUARY 1975 FOR CALENDAR YEAR 1974 AND FOR MAY 1975, SEPTEMBER 1975, AND JANUARY 1976 FOR CALENDAR YEAR 1975.

2/ PERCENTAGES VARY BY STATE AND MAY EXCEED 100 PERCENT DEPENDING ON YEAR-TO-YEAR REPORTING AND PROCESSING PROCEDURES.

3/ NOT INCLUDED WERE 12,511 COWS ON OFFICIAL DHI TESTING IN PUERTO RICO.

4/ NOT INCLUDED WERE 15,953 COWS ON OFFICIAL DHI TESTING IN PUERTO RICO.

TABLE 2.--RELATIVE FREQUENCY OF ERRORS OR CONFLICTS IN OFFICIAL LACTATION RECORDS REPORTED TO USDA IN 1974 1/ 2/

PRELIMINARY EDIT CODE	ERRORS OR CONFLICTS	NUMBER OF ERRORS OR CONFLICTS	PERCENTAGE OF ERRORS OR CONFLICTS	PERCENTAGE OF RECORDS REPORTED
GRADE	SIRE NUMBER ALL ZEROS	1,096,140	96.30	43.87
REGISTERED	COW NUMBER ALL ZEROS	16,531	1.45	.66
REGISTERED	DAM NUMBER ALL ZEROS	4,325	.38	.17
REGISTERED	SIRE NUMBER ALL ZEROS	3,608	.32	.14
REGISTERED/GRADE	SIRE BREED ZERO 3/	2,490	.22	.09
REGISTERED/GRADE	BLANKS IN ANY POSITION OF RECORD	2,364	.21	.09
REGISTERED	COW AND DAM BREED UNEQUAL	2,181	.19	.09
REGISTERED	COW AND SIRE BREED UNEQUAL	1,893	.17	.08
REGISTERED	COW BREED "EIGHT"	1,606	.14	.06
REGISTERED	COW BREED ZERO 3/	1,402	.12	.06
REGISTERED/GRADE	DAM BREED ZERO OR BLANK 3/	1,388	.12	.06
REGISTERED/GRADE	DAYS IN MILK ZERO	1,184	.10	.05
GRADE	EARTAG COW BREED "NON-EIGHT", SIRE BREED UNEQUAL	1,029	.09	.04
REGISTERED/GRADE	ALPHA IN HIGH-ORDER 2 POSITIONS OF COW NUMBER	663	.06	.03
REGISTERED	DAM NUMBER ALPHABETIC	450	.04	.02
GRADE	EARTAG COW BREED "EIGHT", "NON-EIGHT" SIRE AND DAM EQUAL	255	.02	.01
REGISTERED	COW NUMBER ALPHABETIC	215	.02	.01
REGISTERED	SIRE NUMBER ALPHABETIC	178	.02	.01
REGISTERED/GRADE	ALPHA IN HIGH-ORDER 2 POSITIONS OF SIRE NUMBER	111	.01	(4/)
REGISTERED/GRADE	ALPHA IN HIGH-ORDER 2 POSITIONS OF DAM NUMBER	94	.01	(4/)
REGISTERED	SIRE NUMBER IS AN EARTAG	75	.01	(4/)
REGISTERED/GRADE	J THROUGH Z IN TERMINATION CODE	12	(4/)	(4/)
REGISTERED/GRADE	DAYS IN MILK BLANK	8	(4/)	(4/)
TOTAL OR PERCENT OF ERRORS/CONFLICTS		1,138,202	100.00	45.54

1/ TOTAL LACTATION RECORDS SUBMITTED = 2,498,687.

2/ MAIN EDIT NOT INCLUDED BECAUSE MAIN EDIT WAS NOT RUN IN JANUARY 1975.

3/ BUT A NONZERO ID NUMBER.

4/ PERCENTAGE LESS THAN 0.01. MOST VALUES OF 0.01 ARE ROUNDED FROM .0050 - .0099.

TABLE 3.--RELATIVE FREQUENCY OF ERRORS OR CONFLICTS IN OFFICIAL LACTATION RECORDS REPORTED TO USDA IN 1975 1/

PRELIMINARY EDIT	MAIN EDIT 2/ 3/ 4/ CODE	ERRORS OR CONFLICTS	NUMBER OF ERRORS OR CONFLICTS	PERCENTAGE OF ERRORS OR CONFLICTS	PERCENTAGE OF RECORDS REPORTED
GRADE		SIRE NUMBER ALL ZEROS	1,054,642	88.29	43.14
REGISTERED		COW NUMBER ALL ZEROS	38,568	3.23	1.58
	A	CONFLICT WITH INFORMATION PREVIOUSLY REPORTED	24,193	2.03	0.99
	F	CONFLICTING OR QUESTIONABLE CALVING DATE	20,096	1.68	.82
	S	CONFLICTING OR QUESTIONALBE SIRE NUMBER	8,033	.67	.33
	C	CONFLICTING OR QUESTIONABLE COW NUMBER	8,061	.68	.33
	B	CONFLICTING OR QUESTIONABLE BIRTH DATE	6,887	.58	.28
	O	CONFLICTING OR QUESTIONABLE DAM	6,780	.57	.28
REGISTERED		COW BREED ZERO 5/	4,049	.34	.17
REGISTERED		DAM NUMBER ALL ZEROS	3,894	.33	.16
REGISTERED		SIRE NUMBER ALL ZEROS	3,582	.30	.15
REGISTERED/GRADE		SIRE BREED ZERO 5/	2,091	.18	.09
REGISTERED		COW AND DAM BREED UNEQUAL	1,843	.15	.08
REGISTERED		COW AND SIRE BREED UNEQUAL	1,710	.14	.07
	J	EQUAL IDENTIFICATION NUMBER FOR TWO OR MORE OF THE ANIMALS IN THE PEDIGREE	1,441	.12	.06
REGISTERED/GRADE		DAYS IN MILK ZERO	1,212	.10	.05
REGISTERED/GRADE		DAM BREED ZERO OR BLANK 5/	1,157	.10	.05
REGISTERED/GRADE		BLANKS IN ANY POSITION OF RECORD	1,127	.09	.05
	I	INVALID CHARACTERS--USUALLY BLANKS OR ALPHABETICS	959	.08	.04
GRADE		EARTAG COW BREED "NON-EIGHT", SIRE BREED UNEQUAL	799	.07	.03
REGISTERED		DAM NUMBER ALPHABETIC	559	.05	.02
REGISTERED/GRADE		ALPHA IN HIGH-ORDER 2 POSITIONS OF COW NUMBER	499	.04	.02
	G	INVALID STATE CODE	497	.04	.02
REGISTERED		COW NUMBER ALPHABETIC	263	.02	.01
GRADE		EARTAG COW BREED "EIGHT", "NON-EIGHT" SIRE AND DAM EQUAL	211	.02	.01
REGISTERED		SIRE NUMBER ALPHABETIC	190	.02	.01
REGISTERED		COW BREED "EIGHT"	182	.02	.01
REGISTERED		SIRE NUMBER IS AN EARTAG	149	.01	.01
	O	CONFLICTING OR QUESTIONABLE FAT POUNDS	148	.01	.01
	E	CONFLICTING OR QUESTIONABLE BREED CODE	135	.01	.01
REGISTERED/GRADE		ALPHA IN HIGH-ORDER 2 POSITIONS OF SIRE NUMBER	125	.01	.01
	P	CONFLICTING OR QUESTIONABLE FAT PERCENT	125	.01	.01
	M	CONFLICTING OR QUESTIONABLE MILK POUNDS	121	.01	(6/)
REGISTERED/GRADE		ALPHA IN HIGH-ORDER 2 POSITIONS OF DAM NUMBER	89	(6/)	(6/)
REGISTERED/GRADE		J THROUGH Z IN TERMINATION CODE	73	(6/)	(6/)
	N	CONFLICTING OR QUESTIONABLE DAYS IN MILK	26	(6/)	(6/)
TOTAL OR PERCENT OF ERRORS/CONFLICTS			1,194,516	100.00	48.90

1/ TOTAL LACTATION RECORDS SUBMITTED = 2,444,865; TOTAL LACTATION RECORDS REJECTED = 1,254,424.

2/ CONDITIONS USING THESE CODES WERE DISCOVERED IN THE MAIN EDIT AND WERE RECORDED ON THE ERROR TAPES RETURNED TO THE PROCESSING CENTERS. ALL OTHERS WERE DISCOVERED IN THE PRELIMINARY EDIT.

3/ DETAILED EXPLANATIONS OF THE MAIN EDIT REJECT CODES ARE IN DECEMBER 1970 DAIRY HERD IMPROVEMENT LETTER, ARS-44-III (VOL. 46, NO.6).

4/ BECAUSE THE MAY 1975 RUN INCLUDED THE JANUARY 1975 MAIN EDIT ERRORS, THE MAIN EDIT ERRORS FOR JANUARY 1976 ARE NOT INCLUDED IN THIS TABLE. THE NUMBERS FOR EACH ERROR ARE APPROXIMATELY CORRECT.

5/ BUT A NONZERO ID NUMBER.

6/ PERCENTAGE LESS THAN 0.01. MOST VALUES OF 0.01 ARE ROUNDED FROM 0.0050 - 0.0099.

TABLE 4.--SIRE IDENTIFICATION IN OFFICIAL LACTATION RECORDS, 1974 AND 1975, BY STATE 1/

STATE	NUMBER RECEIVED IN--		PERCENTAGE OF ALL RECORDS RECEIVED IN--		NUMBER RECEIVED IN--		PERCENTAGE OF ALL RECORDS RECEIVED IN--	
	1974	1975	1974	1975	1974	1975	1974	1975
	RECORDS WITH NONZERO GRADE SIRE NUMBERS				RECORDS WITH GRADE SIRE NUMBERS THAT ARE ZERO			
ALABAMA	9,900	7,007	32.4	29.7	20,700	16,565	67.6	70.3
ALASKA	100	44	100.0	100.0	(2/)	(2/)	0.0	0.0
ARIZONA	8,700	9,818	29.1	30.2	21,200	22,684	70.9	69.8
ARKANSAS	5,300	4,895	62.1	61.5	3,400	3,064	39.0	38.5
CALIFORNIA	130,500	149,996	36.8	41.3	224,600	212,194	63.2	58.6
COLORADO	13,100	13,688	57.7	57.3	9,600	10,215	42.3	42.7
CONNECTICUT	15,300	16,518	68.8	71.9	6,900	6,454	31.2	28.1
DELAWARE	2,300	2,514	72.0	71.0	900	1,028	28.0	29.0
FLORIDA	11,500	8,207	39.5	33.4	17,600	16,361	60.5	66.6
GEORGIA	12,800	11,131	34.5	34.9	24,300	20,757	65.5	65.1
HAWAII	300	205	5.3	5.0	4,600	3,867	94.7	95.0
IDAHO	13,200	10,727	41.2	41.0	18,800	15,467	58.8	59.0
ILLINOIS	40,900	43,247	67.1	68.9	20,000	19,523	32.9	31.1
INDIANA	30,600	25,338	63.4	61.4	17,600	15,912	36.6	38.6
IOWA	50,800	45,556	60.1	59.5	33,800	31,071	39.9	40.5
KANSAS	35,300	29,645	59.3	58.2	24,200	21,299	40.7	27.8
KENTUCKY	13,500	10,678	51.9	48.5	12.600	11,338	48.1	51.5
LOUISIANA	15,000	9,143	55.4	38.4	12.100	14,648	44.6	61.6
MAINE	16,000	16,064	76.6	76.8	4,900	4,866	23.4	23.2
MARYLAND	30,500	34,628	67.5	75.4	14,700	11,327	32.5	24.6
MASSACHUSETTS	12,900	13,304	64.7	67.2	7,100	6,494	35.5	32.8
MICHIGAN	35,600	80,406	54.0	53.9	30,300	68,733	46.0	46.1
MINNESOTA	98,400	96,059	59.5	56.0	66,900	62,946	40.5	39.6
MISSISSIPPI	8,000	5,630	37.1	32.7	13,700	11,589	62.9	67.3
MISSOURI	27,400	23,663	53.3	52.1	24,000	21,725	46.7	47.9
MONTANA	4,400	4,280	91.3	88.5	400	554	8.7	11.5
NEBRASKA	15,400	13,003	45.8	46.2	18,200	15,127	54.2	53.8
NEVADA	4,200	4,227	65.0	60.7	2,300	2,735	35.0	39.2
NEW HAMPSHIRE	8,900	9,473	77.0	77.5	2,600	2,744	23.0	22.5
NEW JERSEY	11,800	12,237	70.0	70.3	5,100	5,159	30.0	29.7
NEW MEXICO	11,100	14,756	70.5	74.3	4,700	5,099	29.5	25.7
NEW YORK	135,500	139,505	71.5	72.5	54,100	52,838	28.5	27.5
NORTH CAROLINA	31,600	25,330	49.4	48.0	32,300	27,447	50.6	52.0
NORTH DAKOTA	4,100	4,265	52.3	56.0	3,800	3,348	47.7	44.0
OHIO	52,400	54,412	62.7	64.1	31,200	30,512	37.3	35.9
OKLAHOMA	12,900	10,821	40.2	38.3	19,200	17,402	59.8	61.7
OREGON	18,100	14,347	48.0	46.9	19,600	16,228	52.0	53.1
PENNSYLVANIA	120,500	128,185	79.2	79.7	31,600	32,565	20.8	20.3
RHODE ISLAND	900	970	75.6	70.4	300	407	24.4	29.6
SOUTH CAROLINA	13,500	9,838	44.5	38.8	16,800	15,531	55.5	61.2
SOUTH DAKOTA	6,800	6,492	58.6	56.8	4,800	4,947	41.4	43.2
TENNESSEE	16,700	13,248	42.2	39.8	22,800	20,077	57.8	60.2
TEXAS	20,400	15,065	51.3	47.3	19,300	16,752	48.7	52.7
UTAH	15,800	14,519	49.0	45.2	16,400	17,585	51.0	54.8
VERMONT	30,200	31,855	71.4	72.6	12,100	12,046	28.6	27.4
VIRGINIA	45,100	38,808	60.3	58.7	29,700	27,311	39.7	41.3
WASHINGTON	34,700	25,206	45.4	43.8	41,800	32,338	54.6	56.2
WEST VIRGINIA	6,300	8,050	55.9	59.1	5,000	5,561	44.1	40.9
WISCONSIN	141,100	120,685	67.6	66.9	67,500	59,582	32.4	33.1
WYOMING	2,400	2,535	90.2	80.3	300	620	9.8	19.7
UNITED STATES	1,402,547	1,390,223	56.1	56.9	1,096,140	1,054,642	43.9	43.1
					RECORDS WITH REGISTERED SIRE NUMBERS THAT ARE ZERO			
ALL STATES					3,608	3,582	.1	.1
	ALL RECORDS WITH NONZERO SIRE NUMBER				ALL RECORDS WITH SIRE NUMBERS THAT ARE ZERO			
UNITED STATES	1,398,679	1,386,641	56.0	56.7	1,099,748	1,058,224	44.0	43.3

1/ NUMBERS OF RECORDS FOR STATES IN 1974 WERE ROUNDED, SO UNITED STATES TOTALS ARE NOT THE. SUM OF THE STATES

2/ ZERO OR LESS THAN 100.

TABLE 5.--SUMMARY OF OFFICIAL LACTATION RECORDS RECEIVED BY USDA SINCE 1957 1/

	OFFICIAL DHI AND DHIR COWS ENROLLED ON JAN. 1 EACH YEAR	LACTATION RECORDS RECEIVED BY USDA	OFFICIAL DHI AND DHIR COWS REPRESENTED BY RECORDS REPORTED	LACTATIONS REPORTED WITH ZERO SIRE NUMBER		LACTATIONS REJECTED BY OTHER ERRORS		LACTATION RECORDS USED	
	NO.	NO.	PCT	NO.	PCT	NO.	PCT	NO.	PCT
1957--	1,479,799	565,360	38.2						
1958--	1,548,884	786,496	50.8						
1959--	1,607,538	927,998	57.7						
1960--	1,746,752	886,495	50.8						
1961--	1,867,469	1,084,799	58.1						
1962--	1,958,355	1,211,407	61.9						
1963--	2,006,534	1,320,423	65.8						
1964--	2,010,144	1,437,959	71.5						
1965--	2,087,581	1,749,752	83.8						
1966--	2,058,592	1,788,974	86.9						
1967--	2,098,919	1,851,274	88.2						
1968--	2,131,929	1,916,831	89.9						
1969--	2,138,953	1,870,276	87.4	803,926	42.98	65,978	3.52	1,000,372	53.50
1970--	2,122,011	1,907,042	89.9	782,474	41.03	67,032	3.51	1,057,536	55.46
1971--	2,211,366	2,066,743	93.2	852,605	41.25	79,203	3.83	1,134,935	54.92
1972--	2,237,649	2,143,259	95.8	899,087	41.95	76,571	3.57	1,167,601	54.48
1973--	2,349,211	2,417,721	102.9	1,044,785	43.21	94,848	3.92	1,278,088	52.86
1974--	2,404,158	2,498,687	103.9	1,099,748	44.01	(2/)	(2/)	(2/)	(2/)
1975--	2,417,008	2,444,865	101.2	1,058,224	43.28	196,200	8.02	1,190,441	48.69

1/ RECORDS FROM PUERTO RICO NOT INCLUDED.

2/ MAIN EDIT NOT RUN IN JANUARY 1975, SO FIGURES ARE NOT AVAILABLE.

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